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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,945	11/03/2003	Jong-hyeuk Lee	249/418	5047

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LEE & STERBA, P.C.  
Suite 2000  
1101 Wilson Boulevard  
Arlington, VA 22209

EXAMINER

EWART, JAMES D

ART UNIT	PAPER NUMBER
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2683

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/698,945	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> James D. Ewart	<b>Art Unit</b> 2683	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-9, 13-15, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 4-6, 10-12 and 16-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Kavak et al. (U.S. Patent Publication No. 2002/0146029).

Referring to claims 1 and 7, Kavak et al teaches a code reuse method in a code division multiple access wireless communication system using beamforming by an antenna array (0013), the method comprising: (a) examining a spatial correlation between a new mobile station requesting communication and each of existing mobile stations using already allocated codes (0016-0017), based on long-term information reflecting spatial characteristics of beams transmitted to the new and existing mobile stations (0044 and 0047); and (b) selecting one among the already allocated codes to reuse as a code for the new mobile station depending on the results of the correlation examination (0050 and Figure 4). As indicated in 0047, in order to create a desired beam, the beamforming controller determines the beam forming coefficients. These antenna coefficients are characteristics of the antenna and the same coefficients will create the same beam for a substantial period of time and Examiner equates this with long-term information.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kavak et al. in view of Gross et al. (U.S. Patent No. 6,642,894).

Referring to claims 2 and 8, Kavak et al. teaches the limitations of claims 2 and 8, but does not specifically teach that the coefficients describe the beam shape and beam size. Gross et al. teaches that the coefficients describe the beam shape and beam size (Column 7, Lines 41-45). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kavak et al. with the teaching of Gross et al. teaches wherein the coefficients describe the beam shape and beam size to provide a smart antenna capable of beam steering and shaping (Column 1, Lines 16-18).

3. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kavak et al. and Gross et al. in view of Maeda et al. (U.S. Patent Publication No. 2003/0157897).

Referring to claims 3 and 9, Kavak et al. and Gross et al. teach the limitations of claims 3 and 9, but do not teach wherein the beam shape information includes a departure of angle

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representing an angle formed between a beam transmitted to a mobile station and a base station, and an angle spread reflecting a thickness of the beam. Maeda et al. teaches wherein the beam shape information includes a departure of angle representing an angle formed between a beam transmitted to a mobile station and a base station (0018 and figure 5), and an angle spread reflecting a thickness of the beam (Figure 5). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kavak et al. and Gross et al. with the teaching of Maeda et al. wherein the beam shape information includes a departure of angle representing an angle formed between a beam transmitted to a mobile station and a base station, and an angle spread reflecting a thickness of the beam to provide an antenna that is capable of changing a beam-width (0015).

4. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kavak et al. in view of Chheda et al. (U.S. Patent Publication No. 2003/0114162).

Referring to claim 13, Kavak et al teaches a code reuse apparatus in a code division multiple access wireless communication system using beamforming by an antenna array (0013), the apparatus comprising: an orthogonal code generation unit for determining a code that is to be reused and generating orthogonal code information according to the determination results (Figure 4); a long-term information and code information storage unit for storing long-term information reflecting spatial characteristics of beams transmitted to existing mobile stations and code information allocated to the existing mobile stations (0014, 0044 and 0047); and a code reuse unit for examining a spatial correlation between a new mobile station requesting

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communication and each of existing mobile stations using already allocated codes (0016-0017), based on the long-term information and selecting one among the already allocated codes to reuse as a code for the new mobile station depending on the results of the correlation examination (0050 and Figure 4), but does not teach determining whether a code will be reused or not. Chheda et al teaches determining whether a code will be reused or not (Figure 4, 404 and 0023). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kavak et al with the teaching of Chheda et al of determining whether a code will be reused or not to increase network capacity (0016). As indicated in 0047, in order to create a desired beam, the beamforming controller determines the beam forming coefficients. These antenna coefficients are characteristics of the antenna and the same coefficients will create the same beam for a substantial period of time and Examiner equates this with long-term information.

Referring to claim 14, Kavak et al further teaches inputting information to the long-term information and code information storage unit (0014) an orthogonal code generation unit (Figure 4), but does not teach a code reuse determination unit for determining whether an unused code remains to be allocated to the new mobile station, outputting a code reuse OFF signal to the code reuse unit when an unused code remains, and outputting a code reuse ON signal to the code reuse unit when no unused code remains; and a code allocation unit for allocating a remaining unused code to the new mobile station when the code reuse OFF signal is output, and outputting the reuse code information allocated to the existing mobile stations when the code reuse ON signal is output. Chheda et al further teaches a code reuse determination unit for determining whether an

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unused code remains to be allocated to the new mobile station, outputting a code reuse OFF signal to the code reuse unit when an unused code remains, and outputting a code reuse ON signal to the code reuse unit when no unused code remains (0023); and a code allocation unit for allocating a remaining unused code to the new mobile station when the code reuse OFF signal is output (0023), and outputting the reuse code information allocated to the existing mobile stations when the code reuse ON signal is output (0023). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kavak et al with the teaching of Chheda et al of a code reuse determination unit for determining whether an unused code remains to be allocated to the new mobile station, outputting a code reuse OFF signal to the code reuse unit when an unused code remains, and outputting a code reuse ON signal to the code reuse unit when no unused code remains; and a code allocation unit for allocating a remaining unused code to the new mobile station when the code reuse OFF signal is output, and outputting the reuse code information allocated to the existing mobile stations when the code reuse ON signal is output to increase network capacity (0016).

Referring to claim 15, Kavak et al further teaches wherein the long-term information and code information storage unit further stores a mobile station index corresponding to the stored long-term information and code information (0014).

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kavak et al. and Chheda et al in view of Gross et al.

Referring to claim 19, Kavak et al. and Chheda et al teach the limitations of claim 19, but do not specifically teach that the coefficients describe the beam shape and beam size. Gross et al. teaches that the coefficients describe the beam shape and beam size (Column 7, Lines 41-45). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kavak et al. and Barratt et al. with the teaching of Gross et al. wherein the coefficients describe the beam shape and beam size to provide a smart antenna capable of beam steering and shaping (Column 1, Lines 16-18).

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kavak et al., Chheda et al and Gross et al. in view of Maeda et al.

Referring to claim 20, Kavak et al., Chheda et al and Gross et al. teach the limitations of claim 20, but do not teach wherein the beam shape information includes a departure of angle representing an angle formed between a beam transmitted to a mobile station and a base station, and an angle spread reflecting a thickness of the beam. Maeda et al. teaches wherein the beam shape information includes a departure of angle representing an angle formed between a beam transmitted to a mobile station and a base station (0018 and figure 5), and an angle spread reflecting a thickness of the beam (Figure 5). Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Kavak et al., Chheda et al and Gross et al. with the teaching of Maeda et al. wherein the beam shape information includes a departure of angle representing an angle formed between a beam

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transmitted to a mobile station and a base station, and an angle spread reflecting a thickness of the beam to provide an antenna that is capable of changing a beam-width (0015).

***Allowable Subject Matter***

7. Claims 4-6, 10-12 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reason for allowable subject matter is provided below:

Referring to claims 4 and 10, the references cited do not teach calculating orthogonal values between the long-term information of the new mobile station and the long-term information of the existing mobile stations using the already allocated codes.

Referring to claim 16, the references cited do not teach wherein the code reuse unit comprises: ***an orthogonality comparison unit for comparing the long-term information of the existing mobile stations having the already allocated codes***, which is received in the long-term information and code information storage unit, with long-term information of the new mobile station, when the code reuse ON signal is received from the orthogonal code generation unit; ***and a reuse code selection unit for selecting an already allocated code as a code for the new mobile station depending on the results of the orthogonality comparison.***

*Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barratt et al. U.S. Patent No. 5,592,490 discloses spectrally efficient high capacity wireless communication systems.

Cutler, Jr. et al U.S. Patent No. 5,862,479 discloses space-based communication system and method with continuous channel reuse maintenance.

Frank U.S. Patent Publication No. 2004/0063468 discloses method and apparatus for using switched multibeam antenna in a multiple access communication system.

Jaenecke et al. U.S. Patent Publication No. 2002/0006798 discloses cellular radio system.

Roy, III et al. U.S. Patent No. 5,515,378 discloses spatial division multiple access wireless communication systems.

Yun et al. U.S. Patent No. 5,886,988 discloses channel assignment and call admission control for spatial division multiple access communication systems.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James D. Ewart whose telephone number is (571) 272-7864. The examiner can normally be reached on M-F 7am - 4pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on (571)272-7872. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-2600.

A handwritten signature in black ink, appearing to read "James Ewart". The signature is fluid and cursive, with a large initial "J" and a stylized "E".

James Ewart  
October 25, 2005

A handwritten signature in black ink, appearing to read "William Trost". The signature is stylized, with a large "W" and a long horizontal stroke.

WILLIAM TROST  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600